2208L Digital Input Module

Revision 1.0

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This Manual

This manual provides any required information for installation, configuration and operation of the Nico Technology Ltd. 2208L Digital Input Module.

It exclusively treats the handling of this device. It neither describes the LonWorks technology by Echelon nor the LonMark profile implemented in detail. More specific information concerning these subjects can be found in the documentation of Echelon (www.echelon.com) and the LonMark Interoperability Association (www.lonmark.org).

The first part of this manual provides a survey about the device and its installation in chapters 1 to 3. The 2nd part describes the implemented application for lighting control and its configuration possibilities. Chapter 4 contains a description of the firmware interface while chapter 5 describes the implemented LonMark Objects in detail providing an outlook of the individual objects, their tasks and their relevant configuration parameters.

Chapter 6 explains the basics required to connect the objects to each other.

This manual is relevant for all variants of the Nico Technology Ltd. 2208L Digital Input Module where applications for building automation control are implemented.

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2 Product Information

2.1 Functional Elements

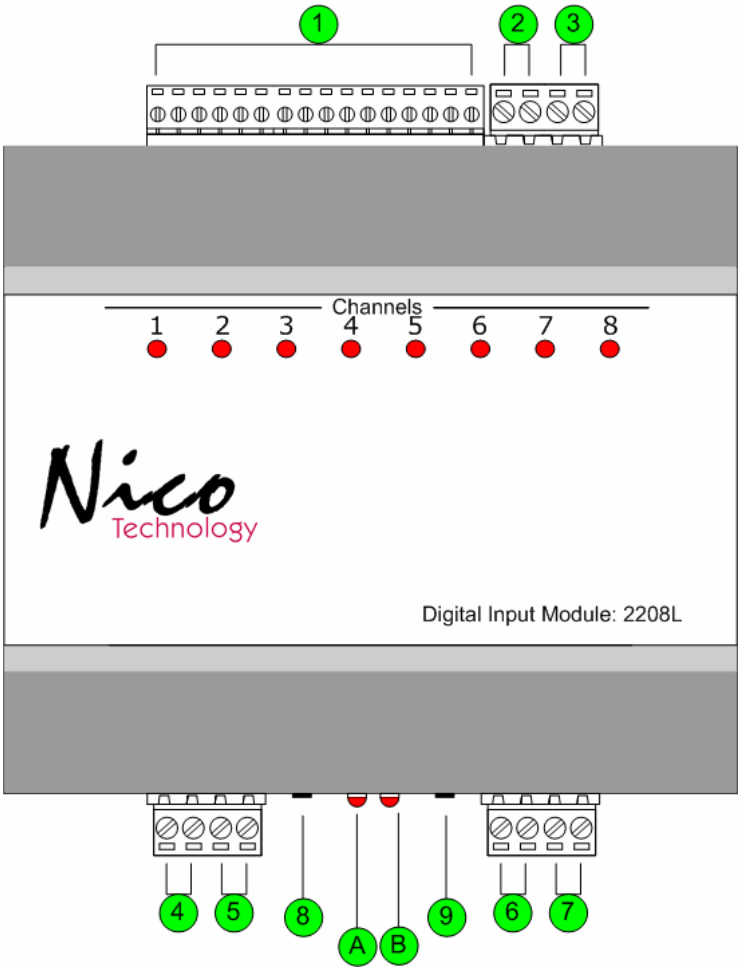


Figure 1.1 2208L Digital Input Module

No	Description
1	Input channels for 24VDC@100mA
2,3	24VDC Input power
4	T1,T2 for Connect to LonWorks network
5	24VDC Input power
6	T1,T2 for Connect to LonWorks network
7	24VDC Input power
8	Service Pin button
9	Reset button
A	Service Pin LED indicator
B	Reset LED indicator

3 Installation

This chapter first describes the installation of the device; the installation of the configuration software is described in section 3.4.

3.1 Warnings

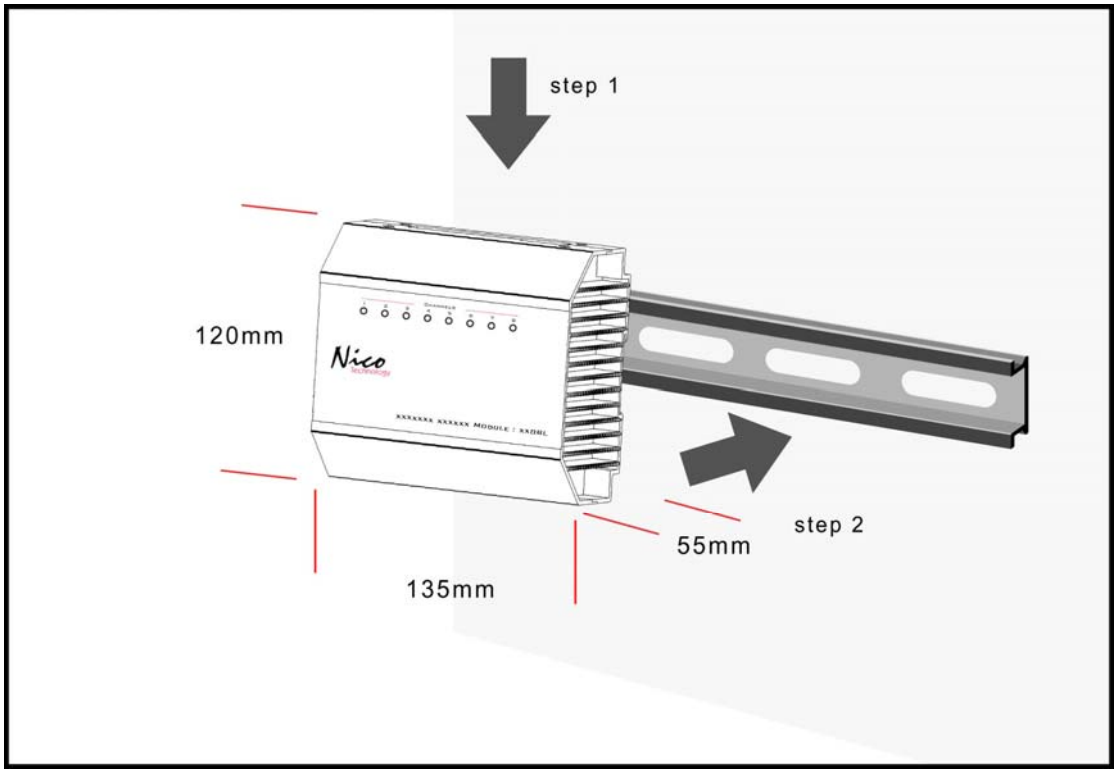
Attention

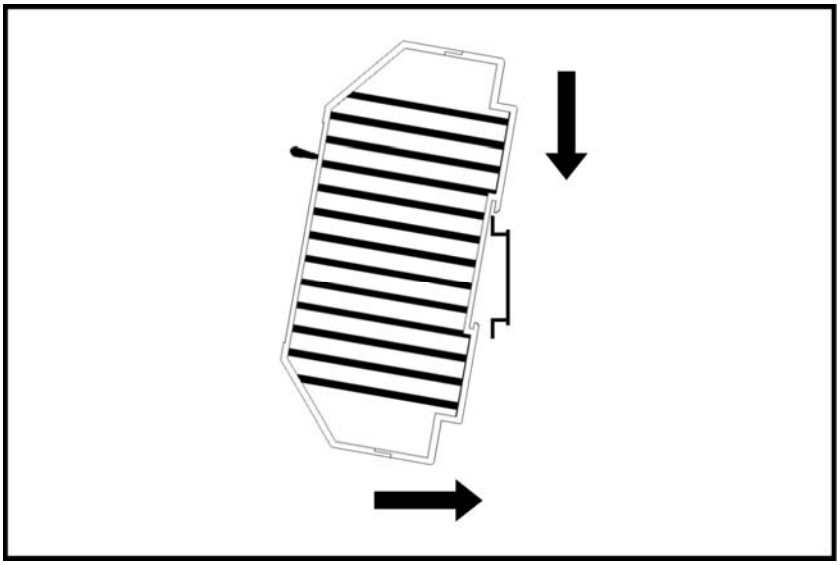
The device must be installed in compliance with the relevant DIN/VDE regulations or the relevant national standards. The connection to the supply voltage must be performed in accordance with VDE 0100 and VDE 0160 or the relevant national standards. Installation should perform by qualified and technical experienced personnel only.

CAUTION

At the connections of the input channels 1 – 4 (Fig. 1.1, terminal **1**) and the power supply (terminals **2**, **3**, **5**, **7**) 24VDC main voltage with load guard band is accessible. The installation of the unit therefore has to be effected in a switch cabinet or behind a respective cover.

3.2 Mounting





3.3 Connections

The 2208L Digital Input Module has to be connected to a 24VDC power supply and to the LonWorks network. According to the respective application peripheral equipment has to be connected to inputs.

Attention

Before connecting peripheral equipment the power supply device has to be switched off.

The connection is effected by means of the included plug-screw terminals.

Clamping range of the plug-screw terminals:

- DC power and network connections (terminals **2 , 3 , 4 , 5 , 6 , 7**): 3.0 mm
- Low voltage connections (terminals **1)**: 2.4 mm

The pin assignment of the connections is described in chapter 3.1, also containing wiring details.

Voltage

The 24 Volt Direct Current connections are through connected in order to achieve easy wiring.

LonWorks Network

The connection to the LonWorks network is made by means of twisted-pair cables. The connection "shield" has to be connected to ground in order to achieve a reliable dissipation of over-voltage on the LON circuits.

Digital Inputs

The actors to be controlled are connected to the DC outputs. In each case the connection is effected terminal **1**).

Attention

The 2108L input power supply must be 24VDC power supply only.

3.4 Software Installation

The configuration software of the 2208L Digital Input Module has to be installed by starting the program Setup.exe on the data carrier provided. It suns under Windows 9x/2000 and NT.

Download url: http://www.nico-tech.com/download

4 Device Description

The 2208L is a Digital Input Module for LonWorks network in building automation. Its peripheral scope has been specially designed for the use as valve controller for device spreading control of applications such as valve control or lighting control.

For the use in building automation control the 2208L Digital Input Module realizes 8 independent input channels.

The LonMark object available per channel flexible use of the 2108L; Furthermore there are several Network Variable Type Translator functions for the operation by network variable type translator function. The configuration of the building automation application is effected via any LonWorks network management tool.

Of course, the 2208L Digital Input Module is also freeing programmable in Neuron C. As a flash module is used the application can be load via the LonWorks network, making the 2108L an I/O controller, e.g. for detail info please contact: Thomas@nico-tech.com

4.1 Hardware Survey

The 2208L Digital Input Module disposes of eight input circuit for each. The input circuit can be accept individually input 24VDC@100mA

4.2 Operation and Display Elements

The 2208L Digital Input Module is fitted with a service button accessible via a small gap on the front panel (see Figure. 1.1, **8**). Activation of the buttons generates a service-pin message transmitted via the LonWorks network. The processor status as well as the service-pin status are displayed by the service LED (figure. 1.1,**A**), which is on while the service button is activated. By use the network management function Wink the service LED flashes.

Furthermore the 2208L Digital Input Module is fitted with a reset LED (figure. 1.1, **B**), displaying the availability of device occur reset. The LED is connection to an I/O pin of the Neuron chip processor.

4.3 Connection Pin Assignment

The following tables show the connector pin assignment of the individual connectors. Connections the ***1*** marking cf. Figure. 1.1 On previously page. In each clamp block pin 1 is situated on the left. For further wiring information see figure 3.2.

LonWorks Network Connection

The double-core bus line can be connection either to LON A or to LON B. No polarity has to be considered by connecting the LonWorks network.

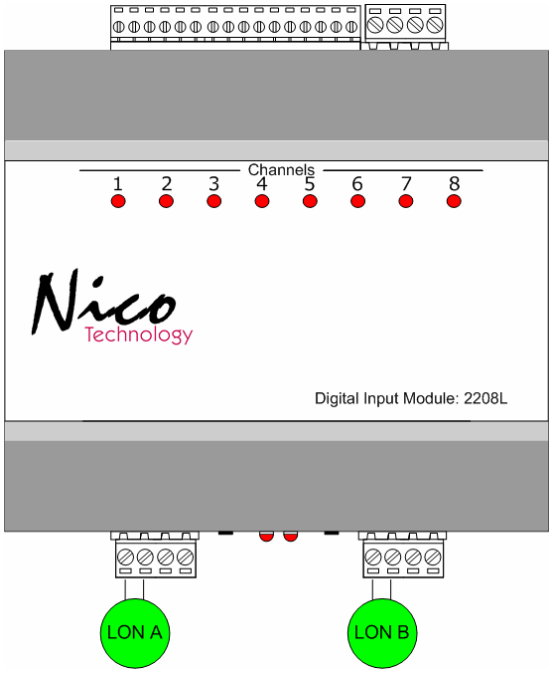


Figure 3.1 Connector pin assignment LonWorks network

Input circuit

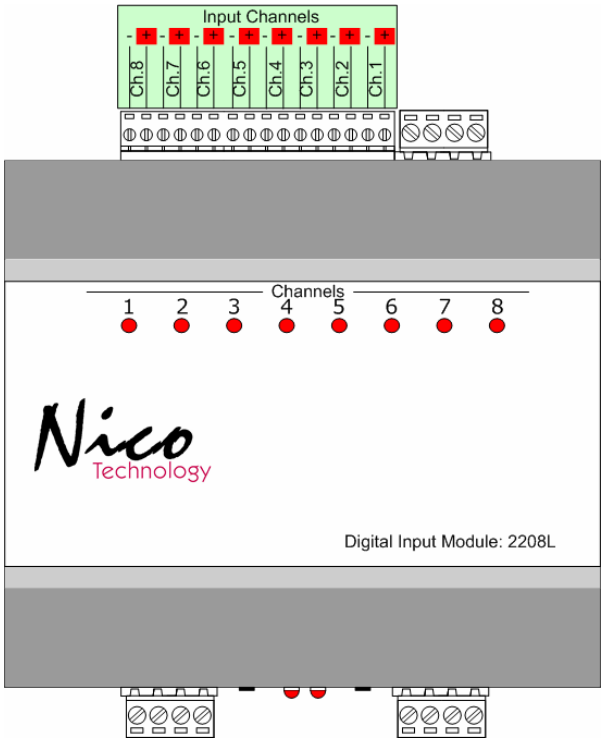


Figure 3.2 Connector pin assignment input circuit.

Power Supply

The 2208L Digital Input Module has to be connected via connector 2, 3, 5, 7 to 24VDC main voltage. Also see figure. 1.1.

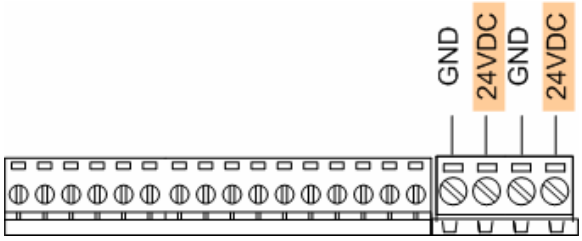


Figure 3.3 Connector pin for Power Supply near input channels side

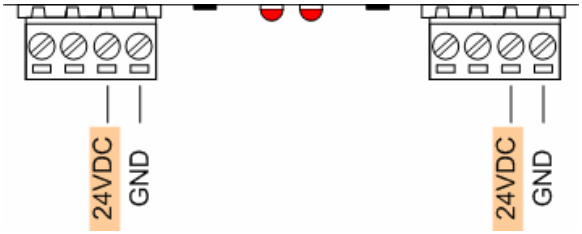


Figure 3.4 Connector pin for Power Supply other side

4.4 Wiring Diagram

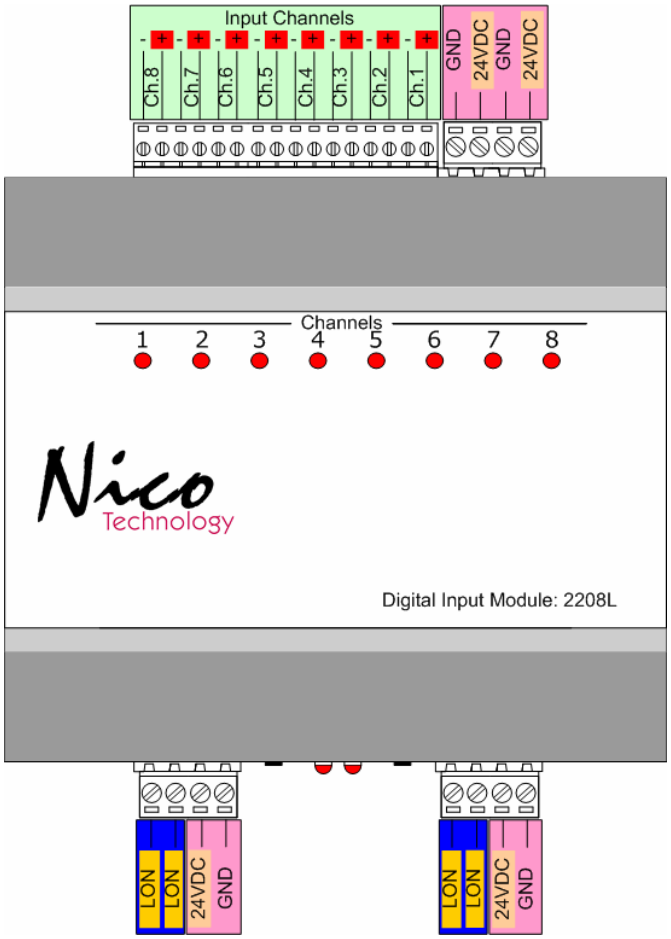


Figure 3.5 Connecting to 2208L

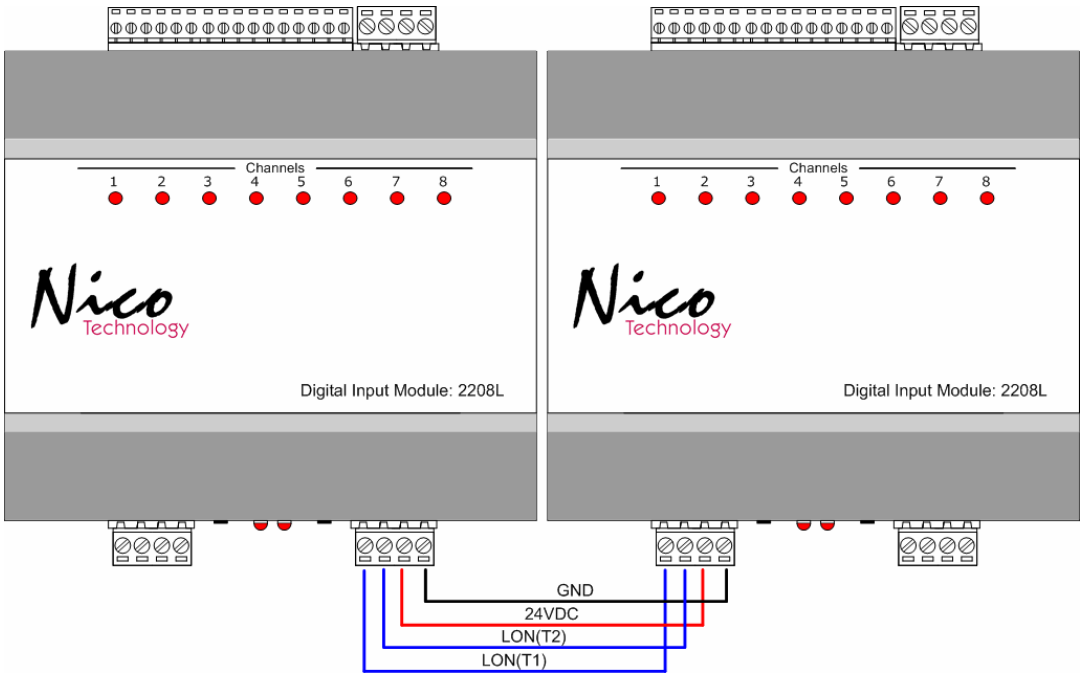


Figure 3.6 Connecting to other one of 2208L or LonWorks device

4.5 EMC

The 2208L Digital Input Module is a CE certified device according to the regulation 89/336/EEC for electron magnetic compatibility, modified by 92/31/EEC". Concerning the emission it fulfills classification B (living area) according to EN 55022A/B, EN 55011 A/B and EN 50081-1/2 and, concerning the interference sensibility, classification A (industrial area) according to EN 50082-2.

4.6 Technical Specifications

CPU	Echelon Neuron 3150,10MHz	
Memory	64Kbytes Flash memory, 512Bytes EEPROM,2Kbytes SRAM,8Kbyte external SRAM	
LonWorks Transceiver	FTT-10A/FT-X1	
Power supply	24VDC	
Power consumption	100mA(Per channel maximum)	
Connection	Plug-screw clamp 2.5mm for input channels, 3.0mm for DC power supply and LonWorks network communication port.	
Temperature	Operation	0 ~ +50
	Storage	-20 ~ +70
Admitted relative humidity	5 ~ 93%, non condensing	
Dimensions	135 x 120 x 55 mm, DIN 43880, incl. clamps	
Mounting	DIN rail(EN 50022, 35 x 15)	
Display & Operation	Service-pin and Reset LED indicator and button	
I/O Channels	8 digital input channels with indicator.	

Table 3.1 Technical Specification

4.7 Dimensions

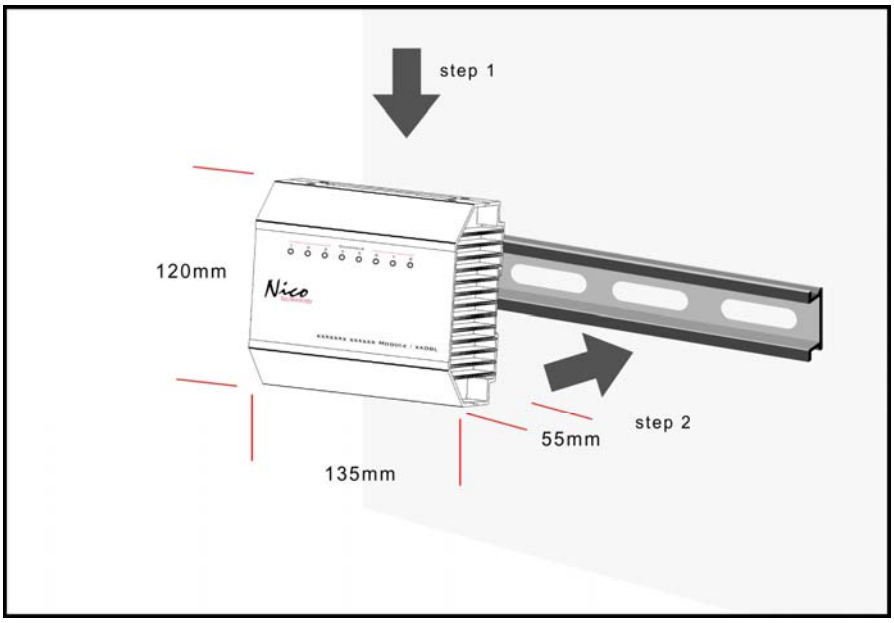


Figure 3.5 Device dimensions without plug-screw clamps

5 Application Software for Building Automation Control

On the 2208L Digital Input Module an application for building automation control is implemented, making input functionality as well as digital control functions available.
Therefore the relevant LonMark profiles stated in Table 4.1 are implemented.
The use of network variables (NV) compiles with the LonMark standard.
SCPT's are used for parameterization by applying the read/write-memory method.

Title	Present Version	Identification
LonMark Application Layer Interoperability Guidelines	V3.1	078-0120-01D
The SNVT Master List and Programmer's Guide	V 8.0	
The SCPT Master List	V 8.0	
Local Clock Functional Profile		
LonMark Functional Profile Open Loop Sensor	V 1.0	001
Signal Input Switch Process Object		

Table 4.1 Referring document about LonMark profiles

5.1 System Scope

The 2208L Digital Input Module is equipped with eight channels for Digital Input.
The digital inputs of the 2208L Digital Input Module allow the connection of actuator. A Digital Input (DI) object, according to LonMark Standard can be assigned to these input and configured.
Furthermore the 2208L can act as constant sensor collector. The sensor collector either generated by the internal DI object; via an output network variable.

The 2108L is equipped with eight digital input circuits to connect e.g. Motion sensor,.

5.2 Interoperable Interface

The LonMark profile *001* is realized in the 2208L Digital Input Module. The network interface remains standardized, clear and especially it is interoperable. That means, the 2208L Digital Input Module can be used in

connection with network components by other manufactures. The following table contains a survey of the network variables defining the 2208L Digital Input Module network interface and their assignment.

NV Name	Type	Allocated Object
nvoLocalClock	SNVT_elapsed_tm	Local Clock Object
nvoSwitch	SNVT_switch	DI Object
nviSwInput	SNVT_switch	Switch Process Object
nvoSwOutput	SNVT_switch	Switch Process Object

Table 4.4 Allocation of NVs and LonMark objects

Under the order code 2208L a data carrier containing the interface describing file ***Nico_DI-2208L_R1.XIF*** and the application ***Nico_DI-2208L_R1.APB*** is provided free of charge at simultaneous purchase of a 2208L. The XIF-file is necessary for integration with LonMaker for Windows or any other LonWorks network management tool.

6 System Objects

This chapter describes the LonMark objects implemented in the 2208L Digital Input Module. For each it states the network variable les used, special configuration properties, general object properties, response during modification of the configuration and after a reset, and, if available, further object properties.

6.1 Node Object

The functionality of the node object is defined in the Application Layer Guidelines of LonMark Interoperability Association (www.lonmark.org).

Network Variables

NV Name	NV Type	Comment
nviRequest	SNVT_obj_request	Status request
nvoStatus	SNVT_obj_status	Status response
nvoAlarm	SNVT_alarm	Alarm generating
nvoFileDirectory	SNVT_address	Address of file for parameterization

6.2 Local Clock (LC) Object

Network Variables

NV Name	NV Type	Comment
nvoLocalClock	SNVT_elasped_tm	Run period time

Configuration Properties

CP Name	CP Type	CP Index	Comment
	UCPTclockCalibrate	16	Clock Calibrate

6.3 Digital Input (DI) Object

Network Variables

NV Name	NV Type	Comment
nvoSwitch	SNVT_switch	I/O status of DI Object

Configuration Properties

CP Name	CP Type	CP Index	Comment
	SCPTdefOutput	7	Default Output
	SCPTinvrtOutput	16	Invert input of nviSwitch
	SCPTmaxSendTime	49	Send heartbeat
	SCPTminSendTime	52	Send throttle
	SCPTdebounce	139	Debouncing time
	SCPTovrBehave	32	Override behavior
	SCPTovrValue	33	Override value
	SCPTobjMajVer	167	Read only; Must read from device
	SCPTobjMinVer	168	Read only; Must read from device
	SCPTlocation	17	Location label
	SCPTmaxRcvTime	48	Receive heartbeat

6.4 Nico Tech. Switch Process Object

Network Variables

NV Name	NV Type	Comment
nviSwInput	SNVT_switch	Switch input
nvoSwOutput	SNVT_switch	Switch output

Configuration Properties

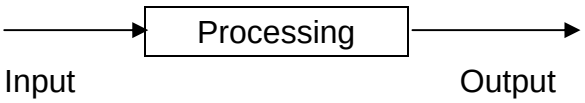
CP Name	CP Type	CP Index	Comment
	SCPTinvrtOutput	16	Invert Input of value
	SCPTdebounce	139	Debounceing time
	UCPTdigitalOProcessType	4	Process type
	UCPTactiveSw	8	Output value for ON state
	SCPTdefOutput	7	Default output
	SCPTmaxSendTime	49	Send heartbeat
	UCPTinactiveSw	9	Output value for OFF state
	SCPTlocation	17	Location label
	SCPTobjMajVer	167	Read only; Must read from device
	SCPTobjMinVer	168	Read only; Must read from device
	SCPToffDely	30	Turn off delay
	UCPTonDely	1	Turn on delay
	SCPTovrBehave	32	Override Behavior
	SCPTovrValue	33	Override Value
	UCPTpulseWidth	12	Pulse width
	SCPTminSendTime	52	Send throttle

Explain UCPTdigitalOProcessType

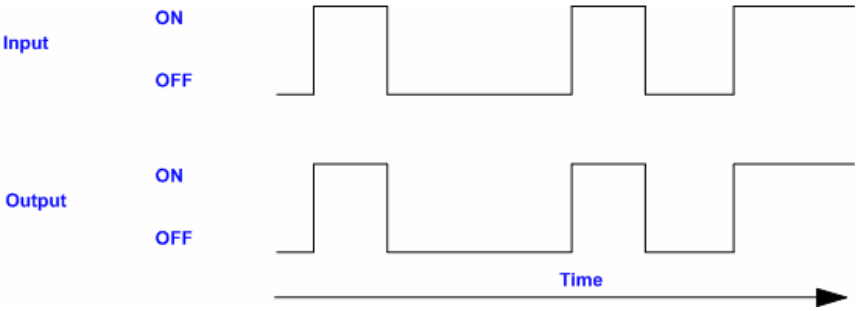
UCPTdigitalOProcessType:

Affects the translation of incoming data to the value passed to the output network variable.

There are five processing options: Direct, Delay, Toggle, Pulse, and One-Sot

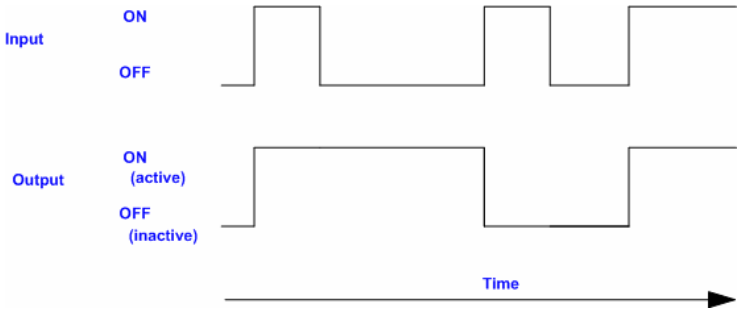


Direct



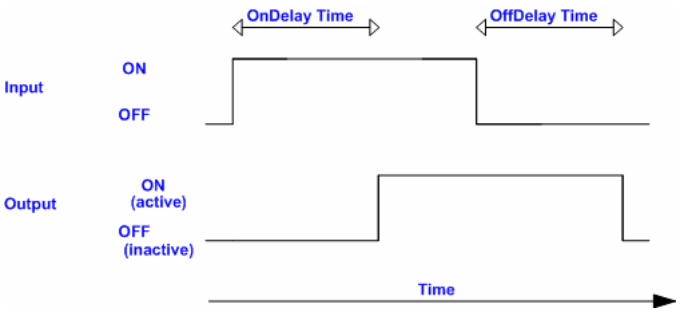
The Direct option causes data to be output directly after the debounce and invert functions have executed.

Toggle



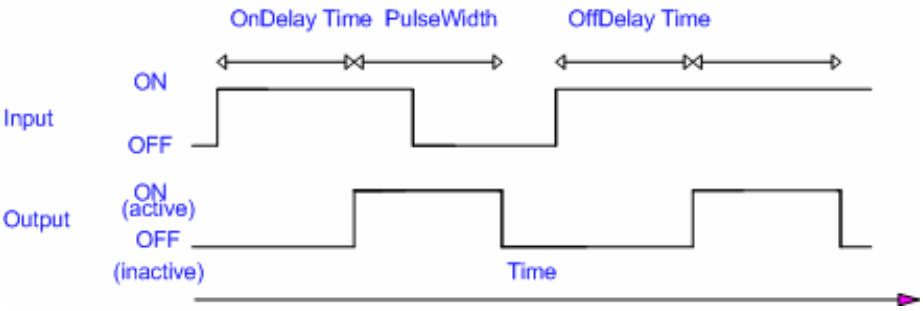
The Toggled option causes the output data to toggle, or change state, every time the input data changes from OFF to ON.

Delay



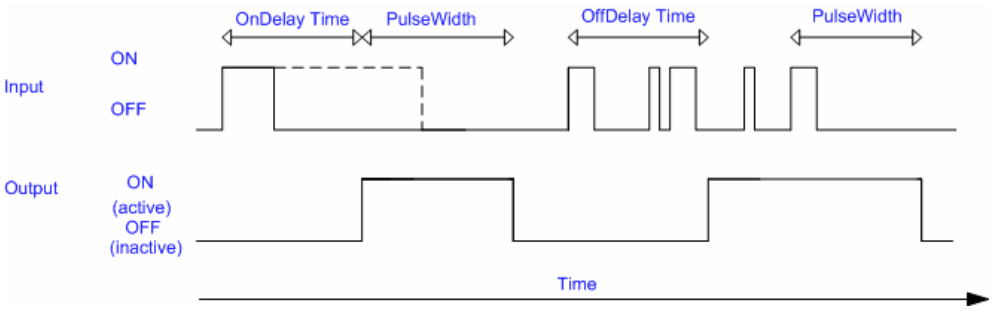
The Delay option specifies a delay from a change on the input to an update on the output network variable. A change from OFF to ON is delayed by the time specify by configuration property Turn-On Delay. A change from ON to OFF is delayed by the time specify by configuration property Turn-Off Delay.

Pulse



The Pulse option generates a pulse on the output network variable every time the input data changes from Off to On. The pulse is generated after a delay specified on the Turn-On Delay. The duration of the pulse is specified on the Pulse width field. It does not matter how long the input data remains on, the output will always send a pulse of the specified length after waiting the configured delay.

One shot



The One Shot option generates a pulse on the output network variable every time the input data changes from OFF to ON state. The pulse is generated after a delay specified on the Turn-On Delay. The duration of the pulse is specified in the pulse width. If the input data changes from Off to On while the pulse is being sent, the pulse timer will be reset (i.e., if a two second pulse was re-triggered after one second, the output would be on for two more seconds, or three seconds total). If a delayed pulse is re-triggered during a pulse, the delay will be ignored. If a pulse is re-triggered during a delay, thee trigger will be ignored.